REZA SOURKI

Ph.D. Candidate, The University of British Columbia (UBC)

+1 250.826.4881

reza.sourki@ubc.ca

SUMMARY

Very enthusiastic and curious with the ability to learn and grasp new skills. Highly motivated and experienced in various engineering projects including characterization, process modelling, manufacturing, optimization, and data analysis. Disciplined, self-starting engineer, successful at team working.

Design phase from concept, characterization, hands-on development, down-scaling and design reviews, up-scaling and software integration.

Mentoring new coming engineers, transferring knowledge and design experience.

Skilled and familiar with Abaqus, ANSYS, COMSOL, LS-Dyna, SolidWorks and CATIA.

Skilled and familiar with C++, Python, R, MATLAB, and FORTRAN software and programming.

EDUCATION

The University of British Columbia (UBC), Canada　　　　　　　　　Fall 2017 – Present
Doctor of Philosophy (Ph.D.), Mechanical Engineering　　　　　　　　　　　　　　GPA: A+
Research: Forming of fabrics, Machine Learning
Advisor: Prof. A. S. Milani, Prof. R. Vaziri

Amirkabir University of Technology (Tehran Polytechnic) &　　　　Fall 2013 – Summer 2016
University of Zanjan, Iran　　　　　　　　　　　　　　GPA: 4.0/4.0 (summa cum laude)
Master of Applied Science (M.Sc.), Mechanical Engineering
Resarch: Fracture Mechanics, Vibrations
Advisor: Prof. M. Ayatollahi, Prof. S. J. Fariborz

University of Zanjan, Iran　　　　　　　　　　　　　　　　　　Fall 2009 – Summer 2013
Bachelor of Applied Science (B.Sc.), Mechanical Engineering　　　GPA: 4.0/4.0 (summa cum laude)
Research: Impact Mechanics
Advisor: Prof. R. Moharrami

HONORS & AWARDS

- **Up-to-date:** A+ class rank (Ph.D.)
- **2020:** Mitacs Globalink Research Award (Ph.D.)
- **2020:** Selected by School of Engineering for Provost Award for Teaching Assistants & Tutors, best TA award (Ph.D.)
- **2019:** Mitacs Accelerate Fellowship (Ph.D.)
- **2018:** University Graduate Fellowship (Ph.D.)
- **2016:** 1st Ranked student among all 60 M.Sc. entrants (M.Sc.)
- **2013:** Unconditional direct admission for graduate studies (B.Sc.)
- **2013:** 1st Ranked student among all 90 B.Sc. entrants (B.Sc.)
- **2011 & 2012:** Awarded as the best student (B.Sc.)
- **2013 & 2016:** Member of Exceptional Talents at university (B.Sc. & M.Sc.)

PROFESSIONAL EXPERIENCE

Harvard University, USA　　　　　　　　　　　　　　　　　　　Jan. 2020 – June 2020
School of Engineering and Applied Sciences
Graduate Research Fellow
- Combining theoretical, computational and experimental methods to gain deeper insight into the non-linear behavior of materials and structures.
- Exploiting the material and geometric non-linearities, guided by theoretical and numerical analysis.

- Designing novel materials with tunable exceptional properties.

Composite Research Network Lab (CRN), UBC, Canada   Sept. 2017 – Present
Graduate Research Assistant and Teacher Assistant
- Advanced characterization, process modeling, and multi-criteria design optimization of composite materials, structures and manufacturing processes.
- Studied and performed graduate course projects on the following areas: Finite Element Method, Multi-Criteria Decision Making and Design of Experiments, Mechanics of Composite Materials.
- Software developed: A simple "To-Do-List" text-like app for windows coded in Python.

German Aerospace Center (DLR)   Jun. 2019 – Aug. 2019
Mechanical Engineer - Collaborator
- Provided a digital twin of an automatic fabric placement device, including the experimental works, numerical analysis, and investigation of the pressure intensities of the fabric placement device.

Niedner Inc.   Jun. 2018 – Aug. 2018
Mechanical Engineer - Intern
- Characterization of advanced textile-based hydraulic tubing systems.
- Process modeling to detect and mitigate bunching, axial and longitudinal buckling.
- In-situ and assembly process analysis of hydraulic tubing systems.

Amirkabir University of Technology (Tehran Polytechnic) &   Sept. 2013 – Aug. 2017
University of Zanjan, Iran
Graduate Research Assistant and Lecturer
- Performed analytical fracture analysis of multi-layered composite mediums.
- Performed multi-physic vibration analysis of unidirectional composite plates under biaxial compressive and tensile loading conditions considering higher order shear deformation theory and Von Karman strains.
- Software developed: "Materials Selection" a windows application coded in MATLAB to select materials with higher priority based on the desired criteria.
- Software developed: "RSS" feed application for windows coded in Python which triggers keywords.

Espidan Research Institute, Tehran, Iran   Mar. 2014 – Feb. 2015
Mechanical Engineer – R&D department
- Structural and stress analyzer, mathematical model for a robotic arm using reversed dynamic technique, analysis of sheet metal pairs in hydroforming, forming, draping and buckling analysis, stress analysis of cylindrical and spherical tanks on elastic foundation.

Iran Transfo Corporation, Zanjan, Iran   Jun. 2012 – Aug. 2012
Mechanical Engineer – Intern
- Sheet Metal, and forming process.
- Provided engineering drawings for the final design using Solidworks and AutoCad.

Niroo Tabadol Zanjan Co., Zanjan, Iran   Jun. 2009 – Aug. 2010
Mechanical Engineer – Intern
- Wrote progress reports, material purchasing, and checked supplies, handled the daily safety requirements.
- Produced insulation for transformers.

University of Zanjan, Iran   Sept. 2009 – Aug. 2013
Research Assistant
- Performed a simulation analysis of a shot-peening process on a welded specimen.
- Software developed: A simple 2D "Tennis Game" for windows, a two-player tennis game coded in C++.

Teaching Activities

The University of British Columbia

APSC 180 (Anonymous Student Evaluation 4.9/5.0)
- Static tutorials
- Covering course material
- Teaching how to approach the problem

Student comment: "I can confidently say that you are one of the most engaging Teachers Assistant that I have had this year. Every tutorial we review the concepts of the specific section we will be learning before doing practice questions. This style of tutorial has been very successful in my opinion as learn the information at first, then I start to fundamentally understand it as I work through the questions. Also, you do a great job at answering my questions that me or other students have when going over a questions solution."

APSC 171 (Anonymous Student Evaluation 4.9/5.0)
- 3D printing project
- CAD/CAM design project
- Video competition

Student comment: "Reza is an incredibly competent TA. He actually seemed to have genuine concern over our performance in the course and our well being. He always made sure everyone understood the material and always was thorough in teaching us. He was very approachable, so I never hesitated to ask him a question when I had one and always explained things clearly. Proof of this is the fact that he's the only TA who's name I know. He was always punctual and showed up to class presentable. He was very friendly but maintained a professional attitude. In my opinion, I would highly recommend him as a TA."

APSC 258 (Anonymous Student Evaluation 4.7/5.0)
- Arduino workshop
- Pressure map under the hull and Propeller Thrust and Efficiency
- Presentation competition
- Annual hovercraft competition

ENGR 492/582 – CIVIL 537 (Volunteer)
- Finite Element Method
- Abaqus FEA
- Python Script
- Matlab/Python

Guest Lecturer – Course APSC 258
Invited as a guest lecturer to talk about the design process and the challenges any R&D department faces during a project progress, in Winter Semester of 2017.

Amirkabir University of Technology (Tehran Polytechnic) & University of Zanjan
Dynamics, Engineering Mathematics, Differential Equations, Advanced Engineering Mathematics (Calculus of Variations), Mechanics of Materials, Elasticity, Vibration of continuous systems

Supervision & Mentorship Activities

Capstone Project Supervisor, UBC
- Co-supervised a group of students from electrical, mechanical and civil engineering programs to provide a system to stream the sensors data to a mobile application wirelessly in the 2018/2019 academic year.
- Supervised a group of students from electrical, mechanical, and civil engineering programs to design a machine learning model to study temperature and cure cycles for advanced manufacturing processes and applications in the 2019/2020 academic year.

Undergraduate Student Mentoring, UBC

Graeme Paul, Daara Abbassi-Mohadjel, Darryl Lam, Louie Federico, Connor Gaudreau, Eric Laksmono

Graduate Student Mentoring, UBC

Connor Keegan, Dipti Nikam

Services/Organizations/Volunteering Activities

Invited Reviewer

International Journal of Solids and Structures – Composite Structures – Journal of Reinforced Plastics and Composites – International Journal of Structural Stability and Dynamics – An International Journal of Advances in Nano Research – Applied Acoustics – Mechanics Based Design of Structures and Machines

Capstone Presentations

Acted as a judge for the Capstone projects held at The University of British Columbia on 3 April 2019.

Engineering One Design Competition – APSC 171, UBC

Acted as an executive committee to hold Engineering One Design Competition. As a Tutorial Instructor, 4 (out of 7) groups of my tutorials entered 20 top teams and have awarded in February 2019.

Judge – Annual Hovercraft Competition, UBC

Acted as a judge for the Hovercraft competition held at The University of British Columbia in March 2018.

Engineering Graduate Students Society (EGSS), UBC

EGSS has the mandate of enhancing the campus experience and opportunities for engineering graduate students. Attending board meetings for EGSS, making decisions, planning the annual symposium and acting as committee coordinator are some of the responsibilities in 2017/2018 academic year.

Judge – Annual SolidWorks Competition, ZNU

Acted as a judge for the SolidWorks competition hosted at the University of Zanjan.

President of Music Club, ZNU

President of the Music Club at the University of Zanjan. My responsibilities included scheduling board meetings, coordinating bands and planning events and annual performances.

Customer Service

During studies, I have worked in many places and have had many hats. I was able to manage time while doing my studies.

Parkinson Recreation Centre, BC, Canada

As a volunteer, I work with people with physical, cognitive, intellectual and mental disabilities in various programs.

'Mehraneh Cancer Care Center' Charity

An organization to support people with cancer. I acted as a member of the board. Enhanced common awareness, fundraising and planned events for seminars.

Journal Papers

16. **R. Sourki**, A. S. Milani, R. Vaziri, Forming of Prepreg Woven Fabrics: Viscous Behavior, Anisotropic Frictional Behavior, and Nonlinear Bending Regimes. **(Under Review)**.

15. **R. Sourki**, A. S. Milani, R. Vaziri, Meso-Level Bending Analysis of Dry Thermoplastic Woven Fabrics: Irreversible Behavior During Forming Process **(Submitted)**.

14. **R. Sourki**, B. Khatir, A. S. Milani, R. Vaziri, S. H. Najar, On the Pure Bending Characterization of Textile Composites: A New Experimental Approach to the Out of Plane Deformation, Composites Part B, **(Revised)**.

13. **R. Sourki**, S. Illyaei, Y. H. Aliakbari, Capsule-Based Healing Systems in Composite Materials: A review, Critical Reviews in Solid State and Materials Sciences, 2020.

12. **R. Sourki**, B. Crawford, R. Vaziri and A. S. Milani, Orientation Dependency and Hysteresis Nature of Inter-Ply Friction in Woven Fabrics, Applied Composite Materials, **(In Press)**.

11. **R. Sourki**, R. Faal, A. S. Milani, Vibration analysis of functionally graded cross-ply composite plates subjected to in-plane loading in thermal environment, Int. J. Appl. Comput. Math, 2020.

10. R.T. Faal, **R. Sourki**, B. Crawford, R. Vaziri and A. S. Milani, Using Fractional Derivatives for Improved Viscoelastic Modeling of Textile Composites. Part II: Fabric under Different Temperatures. Composite Structures, p.112494, 2020.

9. R.T. Faal, **R. Sourki**, B. Crawford, R. Vaziri and A. S. Milani, Using fractional derivatives for improved viscoelastic modeling of textile composites. Part I: Fabric yarns. Journal of Composite Materials, p.0021998320912479, 2020.

8. M. Bastanfar, S. A. H. Hosseini, **R. Sourki**, F. Khosravi, Flexoelectric and surface effects on a cracked piezoelectric nanobeam: Analytical resonant frequency response, Archive of Mechanical Engineering, Vol. 66 Issue 4, p417-437. 21p, 2019.

7. **R. Sourki**, M. Ayatollahi, M. M. Monfared, Mode III fracture analysis of a non-homogeneous layer bonded to an elastic half-plane weakened by multiple interface cracks, Scientia Iranica 25 (5), 2570-2581, 2018.

6. **R. Sourki**, S. Illyaei, M. Bastanfar, M. M. Monfared, Multiple cracks analysis in a FG orthotropic layer with FGPM coating under anti-plane loading, Journal of the Brazilian Society of Mechanical Sciences and Engineering 40 (6): 309, 2018.

5. **R. Sourki**, M. M. Monfared, R. Yaghoubi, Analysis of Multiple Yoffe-type Moving Cracks in an Orthotropic Half-Plane under Mixed Mode Loading Condition, Iranian Journal of Mechanical Engineering Vol 18 (2), 39-62, 2017.

4. **R. Sourki**, S. A. Hosseini, Coupling effects of nonlocal and modified couple stress theories incorporating surface energy on analytical transverse vibration of a weakened nanobeam, The European Physical Journal Plus 132 (4), 184, 2017.

3. **R. Sourki**, M. Ayatollahi, M. M. Monfared, S. M. Mousavi, Multiple cracks in an elastic half-plane subjected to thermo-mechanical loading, Iranian Journal of Mechanical Engineering Transactions of the ISME 17 (2), 19-45, 2017.

2. **R. Sourki**, S. A. Hosseini, Free vibration analysis of size-dependent cracked microbeam based on the modified couple stress theory, Applied Physics A, 122 (4), 413, 2016.

1. R. Moharrami, **R. Sourki**, P. Azadian, Study on Residual Stresses Redistribution in Welded Joint in Shot Peening Process, Journal of Mechanical Engineering University of Tabriz, 46 (3), 185-192, 2016 (in Persian).

Conference Papers

4. **R. Sourki**, A. S. Milani, R. Vaziri, Towards Understanding and Modeling Irreversible Behavior of Woven Fabrics Under Loading-Unloading Bending Regimes, 22nd International Conference on Composites Materials, Melbourne, Australia, 2019.

3. H. Montazerian, **R. Sourki**, M. Ramezankhani, M. Koerber, A. S. Milani, Digital twining of an automated fabric draping process for Industry 4.0 applications: Part I- Multi-body simulation and finite element modeling, The Composites and Advanced Materials Expo, Anaheim, California, 2019.

2. **R. Sourki**, R. T. Faal, B. Crawford, R. Vaziri, A. S. Milani, Fractional Viscoelastic Behavior Of Prepreg Woven Fabrics, CANCOM2019 – 11th Canadian International Conference On Composite Materials, UBC, Canada, 2019.

1. **R. Sourki**, R. Moharrami, A Numerical Analysis of the Shot Peening Process Parameters on Residual Stresses, 21st International Conference on Mechanical Engineering, K. N. Toosi University of Technology, 2013 (in Persian).